

Roy Romer, Governor  
Patti Shwayder, Executive Director

*Dedicated to protecting and improving the health and environment of the people of Colorado*

**HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION**

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**Colorado Department  
of Public Health  
and Environment**

December 17, 1996

Jim Hanley  
US EPA Region 8  
999 18 St Suite 500  
Denver, Colorado 80202

Dear Jim:

Attached you will find a copy of the final report summarizing the results of the sampling efforts to identify sources of elevated Pb levels in Rico, Colorado. Please call me if you have any questions at 692-3449

Sincerely,

Mark E. Walker  
Remedial Programs

96 DEC 19 AM 8:26  
EPA REGION VIII  
SOUTHERN BRANCH

# RICO SAMPLING LOCATION DESCRIPTIONS

## SAMPLES COLLECTED FOR TOTAL Pb ANALYSIS

- RC-2** Location is a new home under construction whose owner is Mike Turrin located in the NE corner of Tract #44. Purpose of this sample series is a demonstration of the characteristics of the undisturbed colluvium. Approximately 10 vertical feet of unconsolidated surficial deposits are exposed in the excavation. Surficial deposits are mapped as undisturbed colluvium containing mixed rock fragments but may contain debris flow and/or glacial moraine material. Material is generally matrix-supported mixed rock fragments. Boulders up to 4-6" in diam. are present throughout 10' exposure. Multiple piles of waste rock are present in the immediate vicinity (<200').
- RC-2A** A soil horizon 0-23". Med brown, pebbly, sandy silt. Moderate or garnet material, larger roots extend from surface through the interval. Krotivinas present, approx. 40-50% silt matrix. Clasts are angular up to 6" diam. and are exposed at surface and throughout the interval. This sample is representative of surficial material @ site. Sample was sieved to <2mm. Clasts include hornblende porphyry, sandstone, limestone, quartzite, and some limonite and iron stained yellow brown clasts. Ground surface is free of mine waste rock.
- RC-2B** B soil horizon; 23-55", sieved to <2mm. Medium reddish brown sandy silt approx 40" of interval. Clasts range from very small to pebbles 3" in diam. Clasts of mixed rock type including porphyry and sandstone. Clasts are strongly weathered. Some organic material consisting primarily of roots, throughout the interval. Clasts are either rounded or sub-angular. Rounded clasts include muscovite granite. Sample doesn't effervesce.
- RC-2C** 55-78" depth, sieved to <2mm. Material is 30% medium reddish-brown sandy-silty matrix and 70% clasts of various rock types. Numerous clasts up to 2-3" diam. Locally larger clasts. Angularity similar to above. Mostly angular some sub-angular. Clasts include shale, sandstone, and porphyry. Sample does not effervesce. Also a few limonitic-altered clasts approx 1/2" diam.
- RC-2D** Sample location is <sup>dock</sup> ~~dock~~ pillar excavation SE corner of garage (Turrin Property). Sample depth is 26" and sieved to <2mm. Top of interval is the bottom portion of B soil horizon based on brownish soil color, clay, and root development above. Sample has wide range of clasts sized up to 18" in diam. Clasts are predominantly angular to sub-angular with a few scattered rounded clasts. Matrix is less than 25% and is granular. Clasts include hydrothermally altered limonitic clasts. No effervescence.
- RC-2E** Same location and sieving as RC-2D. Interval begins at the base of RC-2D and is 24" thick. Matrix is approx 25 % and is sandy silt. No effervescence.
- RC-2F** Same location and sieving as RC-2D&E. Top of sample interval begins at base of RC-2E and extends down to bottom of hole, total length of sample interval is 26". Matrix is reddish-brown silty sand and is less than 25%. Clasts range from small pebbles to boulders up to 2' diam. Most clasts are <2" diam. Clasts include limonitic, iron-stained clasts. Clasts are weathered. Clasts are dominantly angular to sub-angular. No effervescence.

**RC-3** Location is the Silver Creek alluvial fan, 5% westerly aspect. Purpose of this sample is an attempt to replicate a previous sample collected by EPA in their Site Inspection of Rico. Surface (A Horizon) is truncated. Present are clay loam textured materials. Fines are 10YR4/3 (est), very few fine roots decrease to bottom of exposure, no effervescence, unvegetated. Overall, coarse fragments (>10cm) comprise 20% of volume, consisting primarily of latite porphyry; 30% by volume gravel-sized fragments of porphyry and sandstone predominantly rounded; 50% loam. Noted mineralization among fragments (iron oxides, iron oxide after pyrite). No vegetation noted.

RC-3A 0-14" depth, sieved to <2mm

RC-3B 14-28" depth, " " "

RC-3C 29-42" depth, " " "

**RC-4** Location is former site of Grand View Smelter. Purpose of this sample series is a demonstration of any impact from smelting operations. Sampling scheme consists of collection of three samples surrounding the former smelter collected from soils which appear to be undisturbed since smelter operations ceased. Locations are described from a Central Point (CP) which is located approx 47 lateral feet N25°W from the SW corner of the Core Building shown in Figure 1-4 of the Grand View Smelter Application.

**RC-4A** Location is south of former smelter, specifically, S10°W from CP approximately 150 lateral feet. Sample location has a 45° westerly aspect. Vegetation consists of grasses, vetch, aspens (<6" diam). Site is approx 40' downslope from road base material of similar consistency to Van Winkle Mine Dump. Approx 15' from the sample location is a dump consisting of glass and brick material. Soil does not effervesce. Sample from 0-6" depth and sieved to <2mm, consisting of abundant fine/medium roots, moderate sub-angular blocky structure to soil and weak granular structure to soil. Soil is loam with 5% gravel-sized fragments (latite, Hermosa, no mineralization). Color is 10YR4/3. Aspen trunks >6" had curvature suggestive of local downslope movement, while trunks of 2.5" diameter, were straight. Site is colluvium which is excessively drained to the SW.

**RC-4B** 30° slope, somewhat eroded. Vegetation is grasses, composites, gooseberries. Aspens 5" in diam with slight trunk curvature. Site is colluvium. Location is 7' above a bench of Hermosa sandstone outcrop. Westerly aspect, excessively drained to SW. Soil does not effervesce. Soil is moderate/medium granular structure, abundant fine/med roots, 5% gravel mostly angular sandstone fragments, loam texture, color is 10YR3/3. Sample is A Horizon 0-6", sieved to <2mm, with a small amount of charcoal (removed from sample, likely due to uncontrolled fire).

**RC-4C** Location is N40°E approximately 425 lateral feet from CP. 40% slope, colluvium (from greenstone). 12' downslope is a greenstone outcrop. Site is 30' downslope from a roadcut, vegetation is mixed composites and grasses, some vetch, and few aspen seedlings. Westerly aspect, somewhat excessively drained, real erosion apparent. Sample is weak/medium sub-angular blocky and moderate/medium granular structure. 10% gravel of angular greenstone fragments, color is 10YR4/4. No effervescence. Sample is 0-6" A horizon, sieved to <2mm.

**RC-5** Location for the "5A" series of samples is a roadcut approx 1.6 mi N of the Dolores River Bridge on Highway 145 at Rico. Location is an outcrop of the Hermosa (Lower Member). Numerous faults were noted as exposed in the roadcut with weak to moderate hydrothermal alterations. Most prominent fault has associated tufa deposit. The rock material collected is representative of the least-altered material. Location of the "5B" series of samples is a roadcut approx 3 miles south of Rico on Highway 145 (S of Scotch Creek) and the series is representative of the unaltered Hornblende Latite Porphyry. Purpose of all these samples is to demonstrate a "background" nature of the unmineralized bedrock units.

**RC-5A1** Sample is a composite of two limestone outcroppings described as follows: Limestone is medium gray, very fine grained, slightly fossiliferous, dense, strongly jointed, weathering to angular pieces. Minor calcite coating on joint surfaces. No obvious hydrothermal alteration. Second outcrop is described as medium gray, very fine grained, slightly fossiliferous, moderately jointed, dense, weak calcite and limonite on joint surfaces. No obvious hydrothermal alteration.

**RC-5A2** Sandstone is coarse to very coarse, light greenish-gray, predominantly quartz grains with minor feldspar and approx 1% pyrite predominantly euhedral approx 0.1-0.2 mm in size. Sandstone beds greater than 1' in thickness. No obvious hydrothermal alteration.

**RC-5A3** Shale unit is described as follows: Silty shale, med to dark gray, micaceous, somewhat fissile, thinly-laminated beds. No obvious hydrothermal alteration.

**RC-5B** Hornblende Latite Porphyry outcrop. Outcrop is a thick sill intruding the Rico Formation. Hornblende Latite Porphyry is relatively fresh, with no obvious hydrothermal alterations. Composed of hornblende and plagioclase feldspar phenocrysts in a light gray groundmass. Estimated 1% opaque grains in groundmass.

**RC-6** Location is 20' SE of the SE corner of the former Assay Building in downtown Rico. Intent of this sample location is characterization of the ancestral Silver Creek Alluvial Fan. Description of the sampling location generally is as follows: 0-2" is locally disturbed and mixed material. Contains 30% rounded fragments of latite porphyry, sandstone, shale (mineralized). 2-8" interval, loamy texture with abundant fine/med roots, weak sub-angular block, mod/med granular structure, 15% coarse rounded and angular fragments of sandstone, shale (some iron coating) latite porphyry, slag. Soil has slight effervescence "Buried A-Horizon". Vegetation is primarily grasses and color is 10YR4/4.

**RC 6A** Fine fraction (<2mm) of 2-8" undisturbed interval noted in above description.

**RC-6B** Coarse fraction of 2-8" (>2mm) interval described above.

**RC-7** Locations are a series of sites progressing southward along a hillside moving away from the former location of the Acid Plant. Purpose of this sample series is to ascertain any impact due to the former Acid Plant.

**RC-7A** Sample location is approximately 350' SE of the Lime Plant (@ St Louis Tunnel) on a hillside of colluvium derived from Hermosa formation, as the location is 100 vertical feet below an outcrop. Noted remnants of dead trees surrounding the site (likely due to acid deposition). Site is generally excessively drained with some sheet erosion.

Vegetation consists of abundant raspberries and grasses. Slope is approx 60% with a westerly aspect. Sample is mod/med granular, abundant med/fine roots, approx 30% gravel of Hermosa angular fragments; color is 10YR4/4. Loamy texture, sieved to <2mm. Less mineralization (identified by Fe staining) was observed than the RC-4C sample taken just to the south of this location.

- RC-7B Location is approximately 475' SE of Lime Plant noted above. Westerly aspect of 60-70% slope. Well drained site with slope wash and talus of Hermosa sandstones, noted 100' upslope. Soil described as colluvium on an unstable slope susceptible to sheet erosion. Vegetation is primarily broadleaf plants, some sapling aspens, and abundant raspberries. Sample is described as follows: A Horizon (0-6"), sieved to <2mm, consisting of 40% gravel angular fragments of Hermosa sandstone. No mineralization, strong med granular structure with many fine roots, clay loam texture. Color is 10YR4/4. No effervescence noted. Sample was removed from between the cobbles.
- RC-8 Location is 500' N of Smelter Fault just above the road to the Lime Plant noted above. Sample series is representative of the Greenstone and its contribution to the local mineralogy.
- RC-8A Sample is a 10' chip sample across the outcrop face (total wt. approx 5 lbs). Greenstone is dark greenish-gray, weakly foliated, fine-grained, phyllitic, chloritic, with fine epidote crystals on fractures. Greenstone contains a few narrow metamorphic quartz lenses and weak limonitic coating on sparse fractures. Contains very minor quartz-specularite-pyrite-epidote pods and stringers.
- RC-8B Soil sample from A&B Horizons from the same location as RC-11, and sieved to <2mm. Depth sampled was from 0-8". A Horizon is 0-6" and B is 6-8". A Horizon is med/dark brown, slightly gravelly, sandy silt, same as RC-11. B Horizon is medium reddish to yellowish brown, slightly gravelly clayey silt. Moderately organic with moderate vegetative matter (mostly roots). Non-calcareous with clasts same as RC-11.
- RC-9 Sample series is located approximately 55' due E of the RC-3 series of samples. Purpose of this series is to demonstrate the "extent" of the anthropogenic effects seen in the RC-3 series. In comparison to RC-3 samples, this location does not have a truncated A Horizon within the 0-24" interval (an obvious A Horizon is present). Vegetation at this location is primarily grasses and willows.
- RC-9A Location is 0-24". Sample sieved to <2mm. Weak sub-angular blocky, mod/med granular structure. Roots are abundant, fine/med at surface which grades to many fine at the base of the interval. Soil texture is loam, possibly clay loam. Color is 10YR3/3. Soil does effervesce, slightly. Of the total volume, 10% is >10 cm; 30% are gravel-sized fragments of latite porphyry, sandstone, and shale; 60% is <2mm loamy material.
- RC-9B Location of sample is 24-49". Sample sieved to <2mm. Soil is sandy loam red-brown with color approximated as 7½YR4/3, some bodies are 2½YR3/3 silty clay loam. Of the total volume, 50% are boulders (>10 cm; Latite porphyry, sandstone, shale); 20% gravel sized material consisting of rounded fragments of Latite Porphyry, sandstone, shale. Red coloration in soils is due to deterioration of Permian rock, not mineralization. Iron-oxide-after-pyrite presence was noted.

**RC-10; Duplicates**

RC-10A	Duplicate of RC-5B
RC-10B	Duplicate of RC-9B
RC-10C	Duplicate of RC-16A

**RC-16** Location is Block 1, Lots 36-40 in Rico at the corner of Mantz & Glasgow Streets. Sample was collected to replicate results obtained in sample RS-02 of the Phase II Environmental Audit done by Walsh; this was the sample that failed TCLP for Lead. Site is described as original slope of 3% with a westerly aspect. Location of the lot is at the base of an industrial fill area where fill composed of the following was noted: alluvium, timber, treated poles, fragments of pipe, pipe fittings, glass, PVC, disintegrated grout containers. 20' farther uphill to the E, from the edge of the fill area is buried and burned construction debris. Filled area is storage location for natural gas materials: 90' to the NE are two Aboveground Storage Tanks marked "CLR DSL" and "REG". Vegetation at the site is composed of a dense stand of grasses with willows and other trees at the edge of the fill, some composite species. Sample is described as clay-loam texture, color was 10YR3/3 with abundant fine/med roots, weak med sub-angular block, mod/medium granular structure. 10% by volume was gravel-sized fragments of sandstone, shale, latite porphyry. No obvious mineralization of gravel-sized components. 90% by volume was <2mm. Sample was sieved to <2mm.

**RC-21** Exposure in foundation excavation behind the church in Rico. Excavation is cut into a 25% slope with a westerly aspect. Minimal erosion was noted, but some float from the roadway approx 20' upslope was seen. Vegetation consists of spruce and aspen. Aspen of 2" diameter show pistol-butting of trunks, large aspen and spruce do not. Sample site is well drained. Sample site is located approx 75' N of Van Winkle Mine Dump.

**RC-21A** Sample depth is the A Horizon, 0-11". Sample sieved to <2mm. Color is 10YR4/3 (approx). Clay loam texture. Structure is moderate, medium sub-angular blocky and weak medium granular structure. <5% cobbles, greater than 5 cm, consisting of sandstone and latite porphyry. Approx. 15% gravel-sized fragments consisting predominantly of sandstone and latite porphyry. Many med roots. Gradual boundary. Very slight effervescence.

**RC-21B** Sample depth is 11-26", B Horizon. Color is 10YR4/4, clay loam texture. Mod/med sub-angular blocky structure, common fine and med roots. Approx 5% cobbles >10 cm. Approx 20% gravel-sized porphyry and sandstone fragments. Approx 75% fines. No effervescence noted.

**RC-21C** Sample depth is 26-40+", C Horizon. Color is 7½YR4/4. Sandy loam structureless, common med roots. Approx. 25% cobbles >10cm, consisting primarily of quartzite with some sandstone and porphyry. Approx. 30 % gravel-sized fragments of similar composition. No effervescence noted.

#### **SAMPLES COLLECTED FOR SCANNING ELECTRON MICROSCOPY**

- RC-11** Location is on a relatively flat bench 20' E of Greenstone outcrop sample location of RC-8 series. Soil sample is from the A Horizon, sieved to <2mm, and collected from 0-2". Soil is med-dark brown, slightly gravelly, sandy silt, highly organic, abundant vegetative matter in sample (mostly roots). Non-calcareous, no effervescence. Sample composed of gravel clasts (greenstone, metadiorite, and sandstone).
- RC-12** Location is the new house under construction owned by M. Turrin. Same location as the RC-2 series. Sample is the coarse fraction (>2mm) of the A Horizon similar to RC-2A.
- RC-13** Same location as RC-12, RC-2A, Turrin house. Sample is the fine fraction (<2mm) of the A Horizon of undisturbed colluvium.
- RC-14** Same location as RC-3A. Fine fraction, <2mm.
- RC-15** Duplicate sample collected at same location as RC-16A, sieved to <2mm.

#### **SAMPLES COLLECTED FOR CLAY MINERALOGY ANALYSIS**

**RC-7A**

**RC-21A**

#### **SAMPLE COLLECTED FOR TCLP-Pb ANALYSIS**

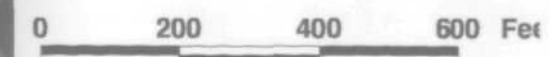
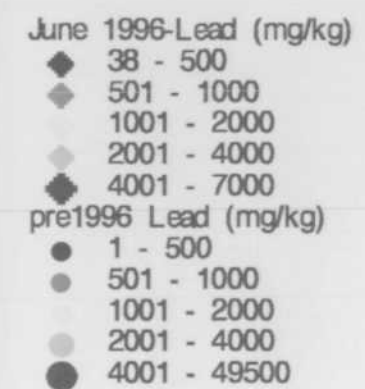
**RC-15 (Duplicate of RC-16A)**

# Color Map(s)

The following pages  
contain color that does  
not appear in the  
scanned images.

To view the actual images, please  
contact the Superfund Records  
Center at (303) 312-6473.





# CDPHE RICO SAMPLES

	SAMPLE NAME	PH	TOTAL LEAD (ppm)	
Undisturbed Colluvium	RC-2A 0-23	5.18	220	
	RC-2B 23-55	5.77	75	
	RC-2C 55-78	5.34	69	
	RC-2D 265-81	5.98	1200	
	RC-2E 264-50105	6.27	3000	
	RC-2F 1051 + 26	6.27	3600	
Disturbed Alluvium	RC-3A	6.21	5600	Ore loading Area
	RC-3B	5.45	550	
	RC-3C	5.53	660	
Colluvium Around Smelter	RC-4A 0-6	NA	2200	Grand View Smelter
	RC-4B 0-6	6.65	7000	
	RC-4C 0-6	6.51	240	
Unmineralized Bedrock	RC-5A1	NA	14	
	RC-5A2	NA	72	Hermosa + Latite Porphyry
	RC-5A3	NA	8.9	
	RC-5B	NA	ND	
Ancestral Alluvial Fan FILL??	RC-6A	7.15	1100	Assay Bldg
	RC-6B	NA	340	
Unmineralized Colluvium	RC-7A	5.81	130	Acid Plant
	RC-7B	6.03	86	
Greenstone Bedrock (A) Soil (B)	RC-8A	NA	38	Greenstone
	RC-8B	6.15	1000	
Undisturbed Alluvium	RC-9A	6.25	330	"Background" for RC-3 Series
	RC-9B	6.75	670	
Duplicates	RC-10A	NA	ND	Dup. of 5B
	RC-10B	NA	430	Dup of 9B
	RC-10C	NA	110	Dup of 16A
Fill? Disturbed	RC-16A	6.74	110	
Colluvium Undisturbed	RC-21A 0-11	6.77	1800	Foundation exc behind Church
	RC-21B 11-26	6.97	1300	
	RC-21C 26-404	7.08	2300	

SAMPLE NAME	PH	LEAD (gpm)	SOIL/BEDROCK TYPE
RC-2A	5.18	220	UNDISTURBED COLLUVIUM
RC-2B	5.77	75	
RC-2C	5.34	69	
RC-2D	5.98	1200	
RC-2E	6.27	3000	
RC-2F	6.27	3600	
RC-3A	6.21	5600	DISTURBED ALLUVIUM
RC-3B	5.45	550	
RC-3C	5.53	660	
RC-4A	NA	2200	UNDISTURBED COLLUVIUM
RC-4B	6.65	7000	
RC-4C	6.51	240	
RC-5A1	NA	14	UNMINERALIZED HERMOSA
RC-5A2	NA	72	UNMINERZLIZED HERMOSA
RC-5A3	NA	8.9	UNMINERALIZED HERMOSA
RC-5B	NA	ND	UNMIN. LATITE PORPHYRY
RC-6A	7.15	1100	ANCESTRAL ALLUVIAL FAN, POSSIBLE FILL MATERIAL
RC-6B	NA	340	
RC-7A	5.81	130	UNMINERALIZED COLLUVIUM
RC-7B	6.03	86	
RC-8A	NA	38	GREENSTONE BEDROCK
RC-8B	6.15	1000	GREENSTONE SOIL
RC-9A	6.25	330	UNDISTURBED ALLUVIUM
RC-9B	6.75	670	
RC-10A	NA	ND	DUPLICATE OF 5B
RC-10B	NA	430	DUPLICATE OF 9B
RC-10C	NA	110	DUPLICATE OF 16A
RC-16A	6.74	110	FILL/DISTURBED
RC-21A	6.77	1800	UNDISTURBED COLLUVIUM
RC-21B	6.97	1300	
RC-21C	7.08	2300	

TABLE  
SUMMARY OF AS, PB AND MN CONCENTRATIONS  
IN SOIL SAMPLES WITH DEPTH

Depth	As		Pb		Mn	
	Mean	95% UCL (Range)	Mean	95% UCL (Range)	Mean	95% UCL (Range)
0" - 2" <i>N = 26</i>	19	23 (5 - 43)	868	1464 (62 - 9300)	2079	3067 (564 - 11300)
0" - 6" <i>N = 30</i>	27.5	32 (7.6 - 62)	725	990 (64 - 3920)	1735	2099 (552 - 6240)
6" - 12" <i>N = 10</i>	16	19 (6.8 - 25)	965	1546 (246 - 3260)	3129	5042 (823 - 10900)
> 12" <i>N = 8</i>	22	25 (14 - 28)	1062	1583 (67 - 2290)	1338	1525 (833 - 1700)

Only ARCO data

**TABLE**  
Concentration of As, Pb, and Mn in Soils from 0 - 2" Depth.

	SAMPLE NUMBER	As (mg/Kg)		Pb (mg/Kg)		Mn (mg/Kg)	
Undist Coll.	RS05	10.0	U	280		1,400	
Native & Stearn	Patrick	10.0		9,300		NA	
Native Colluvium	RS17	10.0	U	540		740	
Native soil	BK11w	5	U	62		NA	
Native Soil	BK10w	43		108	J	3,430	
" "	BK38w	5	U	84		NA	
" "	BK39w	14		96		NA	
	BK15	25		155		11,300	
Native - no mineralization	RSS34	16		306		851	
Undisturbed Colluv	RSS03	23		105		923	
Native soil	Group Tract	13		260		NA	
Native Soil	Ada North	9.8		77		NA	
Native Soil	RS01	10	U	100		1,100	
Disturbed alluvium	RSS22 <sup>(2)</sup>	39		380		1,970	
Disturbed colluvium	RSS23	25		851		1,000	
" "	RSS24	29		2,100		2,710	
	RS24	30		1,000		1,900	
Disturbed Native	RSS27	28		677		1,780	
Dist. Coll. No mine waste	RSS36	28		825		1,530	
Disturbed Native	RSS20	27		791	J	1,460	
Disturbed Coll. No mine waste	School lots	5	U	650		NA	
Fill	Lots 17-20	5	U	830		NA	
Fill	RSS37	20		908		1,660	
Disturbed soils	RSS26	19		675		564	
Disturbed fill	RSS25	28		1,000		1,980	
Dist. Coll. No mine waste	RSS28	19		402		1,130	
0-10" → Fill	N	26		26		18	
	MIN	5.0		62		564	
	MAX	43		9300		11300	
	MEAN	19		868		2079	
	GEOMEAN	16		394		1558	
	MEDIAN	19		471		1495	
	STDEV	11		1779		2409	
	VARIANCE	114		3.16E+06		5.80E+06	
	T-VALUE	1.708		1.708		1.74	
	95% UCL	23		1464		3067	
	FREQUENCY	19/26		26/26		18/18	

— move to 0-6"?

**TABLE**  
**Concentration of As, Pb, and Mn in Soils from 0 - 6" Depth.**

	SAMPLE NUMBER	As (mg/Kg)		Pb (mg/Kg)		Mn (mg/Kg)	
Und. Colluvium	930	7.6		790		1,400	
Und. Colluvium	BK05	8.0		617		1,100	
Und. Colluvium	BK13	22.0		228	J	1,180	
Und. Alluvium	BK14	37.0		1,310	J	1,270	
Und. Colluvium	RSS05	37		1,080		1,830	
Und. Colluvium	BK01	16		206		604	
Colluvium	BK02	18		412		552	
Und. Colluvium	BK03	25		82		818	
Und. Colluvium	RSS02	51		112		1,360	
Und. Colluvium	RSS04	34		138		3,220	
" "	RSS09	28		184	J	1130	
Und. Alluvium	RSS12	27		124	J	710	
Und. Colluvium	RSS13	21		78	J	1090	
Und. Colluvium	BK07	19		66		1020	
" "	BK09	20		141		2120	
" "	BK10	43		108	J	3430	
" "	BK11	38		64	J	1500	
" "	BK12	23		441	J	1250	
Disturbed Alluv.	RSS10 <sup>(2)</sup>	36		143	J	1,030	
	932	18.5		1,150		1,430	
	936	54.1		1,920		3,190	
Fill	RSS30	29		3,920		3,450	
Disturbed colluv	RSS31*	18		893		1,260	
Dist. Colluv.	RSS07	28		2,230		1,840	
Fill	RS04	26		160		1,500	
Alluvium fill	RS02	62		1,500		1,100	
Native fill	RS18	10	U	1,400		2,400	
Native fill	RS16	10	U	750		1,800	
Dist fill	RSS18	32		364	J	6,240	
Dist. fill	RSS17	28		1,150	J	1,230	
	N	30		30		30	
	MIN	7.6		64.0		552.0	
	MAX	62.0		3920.0		6240.0	
	MEAN	27.5		725.4		1735.1	
	GEOMEAN	24.4		378.6		1479.2	
	MEDIAN	26.5		388.0		1315.0	
	STDEV	13.3		853.3		1173.1	
	VARIANCE	177		728071		1376194	
	T-VALUE	1.699		1.699		1.699	
	95% UCL	31.67		990.05		2099.03	
	FREQUENCY	28/30		30/30		30/30	

**TABLE**  
**Concentration of As, Pb, and Mn in Soils from 6 - 12" Depth.**

<b>SAMPLE NUMBER</b>	<b>As (mg/Kg)</b>		<b>Pb (mg/Kg)</b>		<b>Mn (mg/Kg)</b>	
925	14.1		736		1,300	
929	16.6		665		823	
937	6.8		249		895	
934	21.1		2,270		1,600	
935	17.3		953		10,900	
931	24.6		288		4,240	
933	8.6		246		1,240	
941	15.7		3,260		6,720	
942	13.2		424		1,340	
939	17.3		554		2,230	
N	10		10		10	
MIN	6.8		246.0		823.0	
MAX	25		3260		10900	
MEAN	16		965		3129	
GEOMEAN	15		654		2112	
MEDIAN	16		610		1470	
STDEV	5		1003		3301	
VARIANCE	28		1.01E+06		1.09E+07	
T-VALUE	1.833		1.833		1.833	
95% UCL	19		1546		5042	
FREQUENCY	10/10		10/10		10/10	

**TABLE**  
**Concentration of As, Pb, and Mn in Soils greater than 12" Depth.**

SAMPLE NUMBER	As (mg/Kg)		Pb (mg/Kg)		Mn (mg/Kg)	
944	23.0		737		1,240	
945	26.4		1,570		1,570	
946	24.7		2,290		1,500	
938	17.3		598		1,370	
927	13.9		67		1,080	
928	24		210		833	
926	27.9		1,630		1,410	
940	19.5		1,390		1,700	
N	8		8		8	
MIN	13.9		67.1		833.0	
MAX	28		2290		1700	
MEAN	22		1062		1338	
GEOMEAN	22		689		1309	
MEDIAN	24		1064		1390	
STDEV	5		778		280	
VARIANCE	23		604701		78359	
T-VALUE	1.895		1.895		1.895	
95% UCL	25		1583		1525	
FREQUENCY	8/8		8/8		8/8	